ENDOUROLOGY
Case Report

Spontaneous rupture of renal pelvis as a rare complication of ureteral lithiasis

Orestis Porfyris[1], Elena Apostolidi[2], Andromachi Mpampali[2], Paraskevas Kalomoiris[1]

ABSTRACT

Spontaneous rupture of renal pelvis with urine extravasation is a rare condition and usually associated with obstructing ureteric calculus. It poses diagnostic and therapeutic dilemmas, while a stepwise approach for the confirmation of diagnosis, treatment and follow up is needed. We present a case of a 75-year old male patient who had a renal pelvis rupture with perirenal extravasation of urine due to a 4 mm stone located at the right ureterovesical junction. Diagnosis was confirmed by computed tomography, while the patient was treated successfully with the placement of a percutaneous nephrostomy. A week later a CT- nephrostomography showed the healing of renal pelvis with no extravasation and no evidence of the obstructing stone.

Keywords: Pelvis rupture; percutaneous nephrostomy; ureteral calculus; urinoma.

Introduction

Ureteral stones usually present with renal colic due to the distention of the collecting system from obstructing calculus. Most of the stones will pass spontaneously, depending on their size and location, without any further intervention; however a prolonged presence of a calculus could lead to complications such as acute infection, hydronephrosis and renal insufficiency. Spontaneous rupture of the collecting system is a rare complication of ureteral stone obstruction. It is the commonest cause of urine extravasation, while other causes include obstruction from malignancies, trauma, iatrogenic manipulation, pregnancy, pelvoureteral junction (PUJ) obstruction.[1-5] We present a case of this unexpected condition, while diagnosis, therapeutic approach and follow-up are discussed.

Case presentation

A 75-year old male patient was admitted in our emergency department due to persistent right flank pain, right abdominal pain and 3 episodes of vomiting. His temperature, blood pressure and pulse rate were normal. Physical examination revealed abdominal tenderness at the right side, suggestive of localized peritonitis. Serum creatinine, urea, haemoglobin and white blood cells count were within normal limits, while urine examination showed haematuria without pyuria. As far as radiological findings is concerned, ultrasonography revealed a right side medium hydroureteronephrosis with a stone located at the right ureterovesical junction. Further investigation was done with computed tomography (CT scan) showed a 5 mm calculus at the right ureterovesical junction with ipsilateral hydroureteronephrosis. CT urography showed extravasation of the contrast medium in delayed films at the parapelvic, paranephric area and along the ipsilateral ureter, suggestive of rupture of the collecting system, and also fluid collection at the retroperitoneum, suggestive of urinoma (Figure 1).

An ultrasound guided nephrostomy tube was inserted and intravenous antibiotics were given. After 3 days a nephrostomogram was performed and the leakage was still present (Figure 2). After 7 days and while the patient constantly improved, a CT nephrostomography was performed, no contrast medium

[1]Clinic of Urology, General Hospital of Laconia, Sparta, Greece

[2]Clinic of Radiology, General Hospital of Laconia, Sparta, Greece

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Correspondence: Orestis Porfyris
E-mail: orestisporfyris@yahoo.gr

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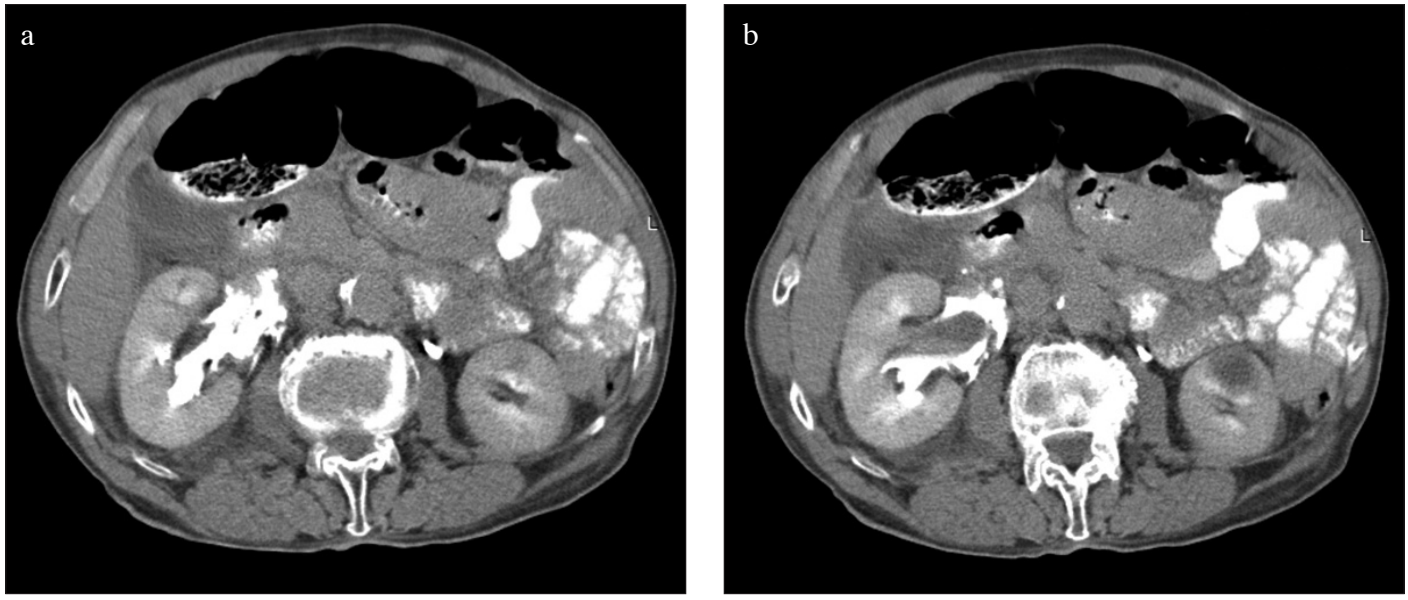

Figure 1. a, b. Delayed films of CT scan depicting contrast medium extravasation

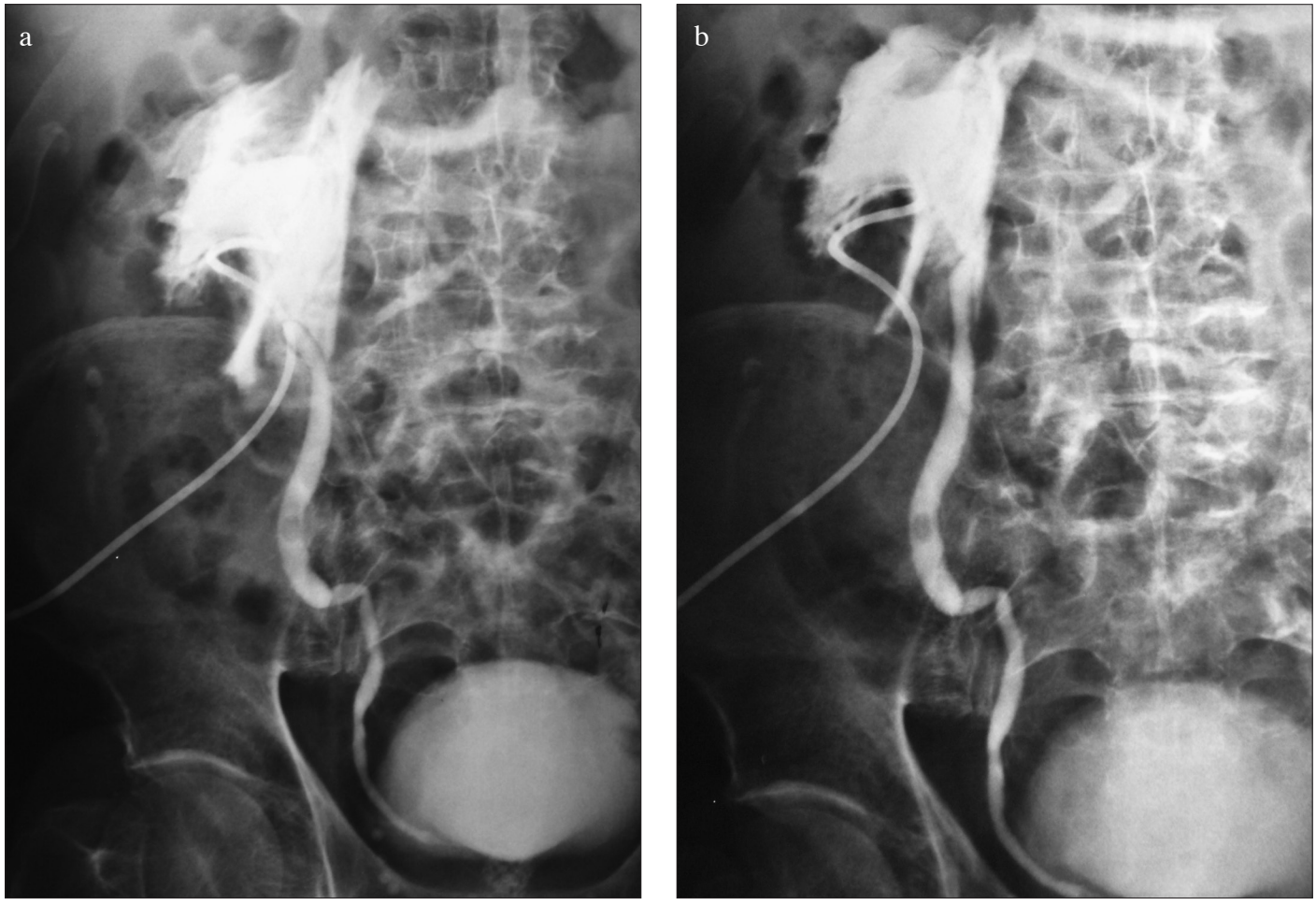

Figure 2. a, b. Nephrostomogram performed 3 days later

Figure 3. a, b. CT nephrostomography depicting a normal renal pelvis

extravasation was found and no stone in vesicoureteral junction (VUJ) (Figure 3). The nephrostomy tube was closed and the next day was removed. The patient was discharged in excellent condition.

Discussion

Renal pelvis rupture is a rare manifestation of ureteral stone obstruction; Wunderlich in 1856 was the first to describe spontaneous pelvic rupture. A more common condition is forniceal rupture which is related to obstruction as well and is caused by the same aetiologies that can cause pelvic rupture.[6] A proposed mechanism is the sudden increase in the intrapelvic pressure that exceeds the tensile strength of the pelvic tissue and results to disruption and extravasation of urine. This phenomenon is likely to be renoprotective by decreasing the pressure in the collecting system and thus preventing its damage.[7] Although it is difficult to assess it, this hypothesis seems rational.

Pelvic rupture has the same symptoms as renal colic, e.g flank pain, nausea, vomiting. Physical examination reveals abdominal tenderness and signs of peritoneal irritation; thus differential diagnosis includes inflammatory diseases of the abdomen e.g appendicitis, cholecystitis. From the imaging tools that are used, plain film of the abdomen may show the stone or signs of paralytic ileus. Ultrasonography usually shows hydronephrosis and perinephric fluid collection. Intravenous urography (IVU) and CT urography (with images obtained 5-20 min after contrast medium injection) are the most accurate imaging modalities and show contrast medium extravasation in the peripelvic, perinephric or retroperitoneal space.

Treatment is dependent to the underlying cause of obstruction. Placement of a double j stent or a percutaneous nephrostomy is the method of choice for the urinary diversion in small ruptures. Percutaneous drainage of the urinoma is seldom necessary. Open surgery can be an option in difficult cases associated with extensive rupture of renal pelvis.[2]

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References

1. Garg PK, Mohanty D, Rathi V, Jain BK. Spontaneous rupture of the renal pelvis presenting as an urinoma in locally advanced rectal cancer. World J Clin Cases 2014;2:108-10. [CrossRef]
2. Bogdanovic J, Djozic J, Idjuski S, Popov M, Sekulic V, Stojkov J. Successful surgical reconstruction of ruptured renal pelvis following blunt abdominal trauma. Urol Int 2002;68:302-4. [CrossRef]
3. Bannowsky A. Iatrogenic fornix rupture caused during retrograde manipulation of the ureter: a case report. Cases J 2008;1:320. [CrossRef]
4. Matsubara S, Morita T, Saito Y, Sato S, Suzuki M. Non-traumatic rupture of the left upper urinary tract during pregnancy wit-

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DOI:10.5152/tud.2015.92979

hout discernable underlying disorders. Arch Gynecol Obstet 2010;282:111-3. [CrossRef]
5. Teper E, Horowitz M. A ruptured calix: unusual presentation of ureteropelvic junction obstruction in an adolescent male. J Urol 2009;181:2301-2. [CrossRef]
6. Gershman B, Kulkarni N, Sahani DV, Eisner BH. Causes of renal forniceal rupture. BJU Int 2011;108:1909-11. [CrossRef]
7. Georgieva M, Thieme M, Pernice W, Trobs RB. Urinary ascites and perirenal urinoma- a renoprotective 'Complication' of posterior urethral valves. Aktuelle Urol 2003;34:410-2.